Tuberculosis Arthritis in a two-year-old Child

K Fowler, C Sinquee-Brown

ABSTRACT

Tuberculosis arthritis (TB) is an infrequent form of extra-pulmonary manifestations accounting for 10–11% of cases (1). It is usually of monoarticular involvement, affecting the large weight-bearing joints. Spread is usually hematogenous from distant sites such as lungs or kidneys. The disease can progress from periarticular and bony erosions to joint destruction. Establishing the diagnosis is usually delayed because early symptoms are gradual in onset. In active TB arthritis, constitutional symptoms such as fever, night sweats or weight loss can be present but may not be seen. Signs of pulmonary and chest X-ray findings are inconspicuous; pulmonary TB is only seen in less than 50% of persons diagnosed with TB arthritis (1). Here, this case reveals the under recognized presentation and diagnosis of TB arthritis and the importance of taking a sound clinical history. A delay in its diagnosis also leads to a delay in its management and increased risk of complications.

Keywords: Arthritis, isoniazid, joint, pyrazinamide and ethambutol, rifampin, tuberculosis

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From: Department of Paediatrics, The University of West Indies, The Bahamas.

Correspondence: Dr K Fowler, Paediatric Resident, The University of West Indies, The Bahamas. Email: fowlergirl1@hotmail.com

INTRODUCTION

Tuberculosis continues to be a burden worldwide: in 2016, it was estimated that about one million children were affected (1). Paediatric skeletal tuberculosis accounts for 5% of cases of TB (6). In The Bahamas, 4.5% of TB cases, in 2016, were children between 0–14 years (2, 3).

This case report, examines a child with an indolent course of knee swelling for three months prior to presentation. To our knowledge, this is the first documentation of TB arthritis in a paediatric patient, in this region.

CASE REPORT

We report a case of a two-year-old female child who was previously healthy from Nassau, The Bahamas. She presented with a three-month history of right-knee swelling and painful limping (Fig. 1).

Fig: 1. Unilateral swelling, right-knee of index case. No skin changes.

There is no report of trauma, bony pain or rash. There were no initial ill contacts noted. The child was on vacation, in Haiti, for two weeks prior to start of her symptoms. She was taken to hospital in Santa Domingo where she received antibiotic treatment for 1.5 months with four

attempts at surgical drainage due to re-accumulation. During that hospital stay, the child was also treated for pneumonia; however, there was no history of fever, cough or shortness of breath. Parents brought her to doctors in The Bahamas for further care. Father admitted to a subjective fever the day prior to this admission, with a three-month history of weight-loss and anorexia but no vomiting, diarrhoea or decrease activity.

The musculoskeletal examination revealed a large effusion to the right-knee which extended to the distal right-thigh; there was an area of fluctuance to the anterior lateral surface. There was mild increased warmth but no erythema. The knee was held at 45-degree flexed position, with decreased active movement.

Radiographic evaluation (Fig. 2) demonstrated soft-tissue swelling and supra-patella effusion: there was increased in the joint space and the distal femur showed lamina periosteal reaction suggestive of osteomyelitic changes. The white blood count was 11.4 x 10/L, haemoglobin 10.4 g/L, platelet 620 x 10/L, erythrocyte sedimentation rate was 72 mm/h and C-reactive protein was 114 mg/L.

Fig: 2. Lateral and anterior-posterior radiograph of right-knee with soft-tissue swelling, supra-patella effusion and increased joint space.

The rheumatoid factor, antinuclear antibody and HIV screens were negative. An ophthalmological evaluation was normal. Presumptive diagnosis of chronic osteomyelitis and septic arthritis was considered.

On review of the history, the patient was visiting in Haiti prior; therefore, a tuberculin skin test (TST) was performed and produced a 16 mm induration at 48 hours; the chest radiograph, however, was unremarkable (Fig. 3.) Patient's mother also had a TST performed which was positive at 20 mm, the father's TST was negative.

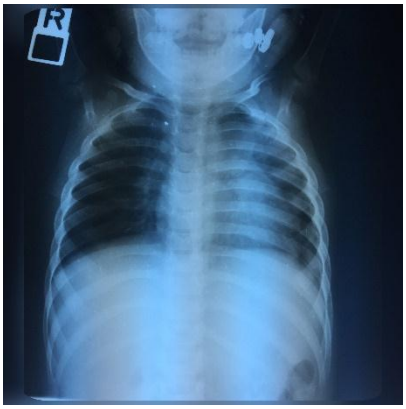

Fig: 3. Chest radiograph. No signs of pulmonary tuberculosis arthritis.

A synovial biopsy was performed of the child's joint and histology showed chronic granulomatous lesion with langhans giant cells and caseating necrosis. Culture of synovium was positive for acid fast bacilli (AFB). Computer tomography (CT) scan of knee showed fluid filled well encapsulated region in the anterior lateral aspect extending into the knee joint, no suggestive bone involvement.

Child was, thereby, assessed as TB arthritis and treatment with RIPE therapy (isoniazid, rifampin, pyrazinamide, ethambutol) and vitamin B6 was initiated and continued for three months, then switched to a two-medicine regime, with rifampin and isoniazid for an additional four months. Prior to start of RIPE, the patient had a re-accumulation of the knee during the 2nd week of her initial hospital stay in The Bahamas; repeat incision and drainage was performed which lead to significant reduction swelling and increased mobility. There has been nil reaccumulation since discharge and patient is currently able to weight bare without difficulty.

DISCUSSION

Although TB arthritis is a rare occurrence, early detection is important for joint preservation and function. Establishing the diagnosis is usually delayed because of lack of pulmonary and radiologic involvement, as well as, early symptoms are gradual in onset (7, 8). It is usually of monoarticular involvement, affecting the large weight-bearing joints, including hips, knees and ankles; however, 3–50% of TB arthritis can involve multiple joints (3, 9). Spread is usually hematogenous from distant sites such as lungs or kidneys. The disease can progress from periarticular and bony erosions to joint destruction (3).

The gold standard for diagnosis is the confirmation of acid fast bacilli in any body tissue or fluid. Synovial fluid analysis may reveal polymorphonuclear leucocytes predominance with a leucocytosis between 10 000 and 20 000 cells/mL. Culture of the fluid may not yield M. Tuberculosis with only 20–40% of culture positive cases (3). Synovial biopsy, however, is the gold standard for TB arthritis which is seen in 80% of cases (3).

The clinical presentation most commonly includes pain and swelling with restricted movements to the affected areas (6). Deformity of the limb may occur due to wasting and lack of use. In active TB arthritis, constitutional symptoms such as fever, night sweat, or weight-loss can be present but may not be seen (10). Signs of pulmonary and chest X-ray findings are inconspicuous and pulmonary TB are only seen in less than 50% of persons diagnosed with TB arthritis (4, 7).

Radiologic manifestations of the joint usually occurs after two to five months of the disease and is characterized by osteoporosis of the bone near the joint, gradual loss of joint space and osseous erosion; and enlarged growth plate in children (8). Computer tomography of the joint is

excellent for assessing the bones, however, MRI is better for the assessment of the joint and the extent of the disease (8).

Antimicrobial medications are the mainstay of treatment for tuberculosis, including TB arthritis (3). It has been recommended 12–18 month of treatment and even longer in children and immunocompromised hosts (3). However, more recent randomized controlled trials are demonstrating efficacy with six to nine months of treatment including two months of isoniazid (INH) and rifampin (RIF), pyrazinamide (PZA), and ethambutol (EMB)/streptomycin and six to nine months of INH and RIF (3). With 6–11 month's treatment, relapse rate is between 2–4.3%; with greater than 12 months of treatment, this decreases to 0.74%. According to CDC, there is no role for corticosteroid treatment in TB arthritis, although recommended in other forms of EPTB (11).

This case highlights the under recognized presentation and diagnosis of TB arthritis and the importance of thorough clinical history. Initial presentation can be like septic arthritis, osteoarthritis and rheumatoid arthritis; but where risk factors for TB are present and where there is lack of resolution and worsening monoarticular arthritis, TB arthritis must be considered. A multidisciplinary approach is important for optimal outcome.

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